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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,896	08/20/2003	Nobuo Aoi	740819-1033	4663

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EXAMINER	
OLSEN, ALLAN W	
ART UNIT	**PAPER NUMBER**
1763	

DATE MAILED: 04/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/643,896	AOI, NOBUO	
	Examiner	Art Unit	
	Allan Olsen	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-18* is/are pending in the application.

4a) Of the above claim(s) *11-18* is/are withdrawn from consideration.

5)☒ Claim(s) *7 and 8* is/are allowed.

6)☒ Claim(s) *3-6,9 and 10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/492,841.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 9 and 10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. Claim 9 has been amended to again explicitly exclude O2. The originally filed application does not support such a limitation.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 now recites:

"...an etching gas containing a N_2 gas and a fluorinated hydrocarbon gas as main constituents..."

The phrase "main constituent" renders the claim indefinite. Neither the specification nor the claim defines this phrase. Therefore, one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 9 is rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 6,472,317 issued to Wang et al. (hereinafter, Wang).

Wang teaches forming a plasma from a mixture of N_2, H_2 and $C_xH_yF_z$ to anisotropically etch an interlayer insulating film composed of an organic-inorganic hybrid material, such as HSQ and BCB. See column 5, lines 36-50 and column 6, lines 5-24 and 50-54. Regarding the "main constituent" limitation - It is noted that Wang teaches an etchant comprising various gases. Wang specifically identified three component gases. While the volume percentage of the fluorocarbon may less than that of N_2, Wang purposefully targeted fluorocarbons as being important constituents. As the phrase "main constituent" has not been defined, the previous rejection is maintained in view of the Wang's recognition the importance of adding a fluorocarbon.

Claims 9 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 6,168,726 issued to Li et al. (hereinafter, Li).

Li teaches the anisotropic plasma etching of organo-silane films. Li teaches generating a plasma from an oxygen -free gas mixture comprising a fluorohydrocarbon, N_2 and Ar. See column 6, line 34 – 43; column 12, line 66 – column 13, line 2.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3-6, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato in JP 10-268526 (hereinafter, Sato).

Sato teaches anisotropically etching an organic-inorganic composite film. Sato teaches the plasma source gas may comprise NF3, F2 or CHF3. Sato also teaches that at least one of N2 H2 and Ar may be added. See paragraphs [0050], [0060], [0084] and [0088].

Sato does not explicitly teach a specific mixtures being claimed.

It would have been obvious to one skilled in the art to use a plasma gas of N2/F2/H2 or NF3/H2 or CHF3/N2 because the teaching of Sato encompasses each of these compositions. Also, it would have been obvious to add Ar to each of these compositions because Sato explicitly teaches that Ar may be added.

Response to Arguments

Applicant's arguments filed December 22, 2005 have been fully considered but they are not persuasive.

With respect to Wang, applicant argues that because Wang teaches adding a slight amount of a fluorinated hydrocarbon Wang's etchant is not one in which N_2 and a fluorinated hydrocarbon are "main constituents". However, in view of the noted indefiniteness of the phrase "main constituents", this phrase was afforded little weight and was considered to broadly encompass a component that significantly contributed to the process.

With respect to Li, applicant argues the fluorocarbon "(CF3)" disclosed by Li contains no hydrogen, whereas the etchant of the present invention contains a hydrogen component. Applicant also argues that Li teaches the use of N_2 as an added gas and as such the N2 of Li cannot constitute a "main constituent". Applicant argues that Li does not teach nitriding the surface of the organic-inorganic hybrid film so that the sidewalls of a depressed portion in the organic-inorganic hybrid film are protected and thereby providing excellent etching anisotropy.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., hydrogen in the etchant and nitriding sidewalls of the organic-inorganic hybrid) are not recited in the rejected claims. Regarding the presence of hydrogen, the examiner notes that claim 9 recites "fluorinated hydrocarbon". When giving this phrase the

broadest reasonable interpretation, the examiner does not considered this phrase to require the presence of hydrogen. For example, the hydrocarbon methane, CH_4, can be fluorinated with anywhere from one fluorine atom (fluoromethane) to four fluorine atoms, CF_4 (tetrafluoromethane or perfluoromethane). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

It is noted that applicant does acknowledge Li's use of a hydrogen-containing fluorocarbon. Applicant states, "While Li et al. further discloses that hydrofluorocarbon maybe used instead of fluorocarbon as noted in column 14, lines 36 through 41, it is noted that the N_2 gas is also used as the added gas, and thus Li et al. is significantly different from that of the present invention.

This argument is not understood and the examiner assumes that applicant intended to say, it is noted that the **O_2** gas (rather than N_2) is also used as the added gas, and thus Li et al. is significantly different from that of the present invention. While Li does not provide an explicit example in which N_2 is used in conjunction with a hydrogen-containing fluorocarbon, the examiner notes that Li's general teachings clearly encompass the combined use of N_2 and a hydrogen-containing fluorocarbon

Allowable Subject Matter

Claims 7 and 8 are allowed.

Conclusion

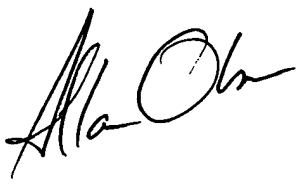
Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Olsen whose telephone number is 571-272-1441. The examiner can normally be reached on M-F 1-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allan Olsen
Primary Examiner
Art Unit 1763